

**Appl. No.** : **10/810,048**  
**Filed** : **March 26, 2004**

## **REMARKS**

The office action mailed on June 28, 2005, has been reviewed, and this paper is responsive thereto. Claims 22-36, and 39 remain pending in this application. Claim 40 is added. Claims 1-21 and 37-38 are canceled.

### **Amendment to the Specification**

Applicant has amended the specification to remove the term “wherein” as requested by the examiner.

### **Claim Objections**

Applicant has amended claim 31 by adding a period to conclude the end of the claim as requested by the examiner.

### **Discussion of Claim Rejections Under 35 U.S.C. § 102(b)**

Claims 22-32, 34, and 39 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Deng et al. (Applied Physics Letters, 2001), hereinafter referred to as *Deng*. With respect to independent Claim 22, the Examiner’s ground of rejection is that *Deng* discloses a microfabricated circuit that includes each feature recited in Claim 22. Applicant respectfully traverses this rejection.

Claim 22 recites in relevant part:

A device for controlling transport of magnetic beads between a position X and a position Y along a path P, the device comprising:

a plurality of current-carrying structures having a non-constant charge current density when conducting a current . . .

The Examiner states that *Deng* shows a microfabricated circuit that includes a plurality of current-carrying structures having a non-constant charge current density, because it shows “two current-carrying wires that . . . generat[e] magnetic-field maxima that fluctuate between the wires by increasing and decreasing the magnetic fields.” Office Action at page 3.

Applicant respectfully submits that the current carrying structures disclosed in *Deng* do not have non-constant charge current densities. Rather, *Deng* only shows a system in which input current (rather than charge current densities) is changed in order to move microbeads from one place to another. It does not teach or disclose utilizing a “non-constant charge current

**Appl. No.** : **10/810,048**  
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density when conducting current” to achieve such an effect. For example, in the second column of page 1776, *Deng* states that “[t]he wires can carry *continuous* dc current of at least 10 A . . . .” This statement indicates that the charge current density is constant while the wires are carrying electrical current. Moreover, in the prior sentence, *Deng* discloses that “[a]ll the wires in the system had uniform dimension . . . .” This statement clearly suggests that any charge current density in *Deng* must be constant while conducting an electrical current. In contrast to the “uniform dimension” of the wires in *Deng*, paragraphs 22-24 of the present specification state that in certain embodiments “[t]he nonconstant charge current density can be generated by varying the shape of the cross-section . . . [or] varying the cross-section surface area . . . [or] varying the width of the current carrying structure along the current direction.” Thus, the charge current density when the current-carrying structure is actually carrying a current may be non-constant as a result of variations in the uniformity of the current-carrying structure. However, as noted above, *Deng* explicitly notes that his current carrying structures are of “uniform dimension” and thus the current density remains constant as current passes through the “uniform” structures shown in *Deng*.

Because *Deng* fails to teach, disclose, or otherwise suggest a “plurality of current-carrying structures having a non-constant charge current density when conducting a current,” Claim 22 is allowable over the cited reference for at least this reason.

Claims 23-32, 34 and 39 each depends from Claim 22, and is therefore allowable for at least substantially the same reason.

#### **Claim Rejections Under 35 U.S.C. § 103**

Claim 36 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over *Deng* in view of U.S. Pat. No. 4,021,790 to Aiken et al. As Claim 36 depends on allowable Claim 22, Applicant submits that it is allowable for at least the same reasons as discussed above in connection with Claim 22.

#### **Remaining Claims**

Claims 33 and 35 are objected to as being dependent on a rejected base claim. In view of the arguments presented above in connection with Claim 22, Applicant submits that these claims are also allowable. New Claim 40 also depends from allowable Claim 22. Applicant submits

**Appl. No.** : **10/810,048**  
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that this new claim is also allowable over *Deng* for at least the reasons stated above and its separately recited features.

### **CONCLUSION**

Each of the rejections having been addressed, Applicant respectfully submits that the application is in condition for allowance. Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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AMEND

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